

What is claimed is:

1. A programmable radio comprising:
 - (a) at least two functional modules, at least one of the at least two functional modules executing programmed instructions to provide at least one functional aspect of the radio; and
 - (b) an internal network connecting the at least two functional modules, communications between the at least two functional modules over the internal network conforming to packet network protocols.
2. The radio of claim 1, wherein the internal network is chosen from a category of networks consisting of an Ethernet network, an asynchronous transfer mode network, a token ring network and a resilient packet ring network.
3. The radio of claim 2, wherein the packet network protocols are chosen from a category of packet network protocols consisting of an Internet Protocol suite and a set of network standards conforming to IEEE 802.
4. The radio of claim 3, wherein the Internet Protocol suite is chosen from a category of Internet Protocol versions consisting of an Internet Protocol version 4 and an Internet Protocol version 6.
5. The radio of claim 3, wherein the packet network protocols are chosen from a category of packet network protocols consisting of a User Datagram Protocol, a Transmission Control Protocol, a RealTime Protocol, a Dynamic Host Configuration Protocol, a Bootstrap Protocol, a

File Transfer Protocol, a Trivial File Transfer Protocol, a Simple Network Management Protocol and a Domain Name System.

6. The radio of claim 2, wherein the packet network protocols are chosen from a category of packet network protocols consisting of a User Datagram Protocol, a Transmission Control Protocol, a RealTime Protocol, a Dynamic Host Configuration Protocol, a Bootstrap Protocol, a File Transfer Protocol, a Trivial File Transfer Protocol, a Simple Network Management Protocol and a Domain Name System.

7. The radio of claim 1, wherein the packet network protocols are chosen from a category of packet network protocols consisting of a User Datagram Protocol, a Transmission Control Protocol, a RealTime Protocol, a Dynamic Host Configuration Protocol, a Bootstrap Protocol, a File Transfer Protocol, a Trivial File Transfer Protocol, a Simple Network Management Protocol and a Domain Name System.

8. The radio of claim 7, wherein the packet network protocols implement network functions are chosen from a list of network functions consisting of:

(a) assigning addresses to the functional modules;

(b) maintaining a listing of the functional aspects of the radio and the at least one functional module associated with the functional aspects;

(c) loading the programmed instructions into the at least one functional module;

(d) controlling the execution of the programmed instructions within the modules;

(e) monitoring the status of the modules; and

(f) replacing a failed one of the functional modules with a replacement module and loading the programmed instructions of the failed module into the replacement module to provide the functional aspect of the failed module.

9. The radio of claim 7, wherein the packet network protocols facilitate conveying real time streaming media between modules.

10. The radio of claim 9, wherein:

(a) at least one module receives real time streaming media and segments the real time streaming media into data packets for communication over the internal network; and

(b) a second module receives the data packets into buffers therein and assembles the data packets from the buffers for transmission from the radio as a stream of output data corresponding to the real time streaming media.

11. The radio of claim 1, wherein the internal network further comprises a network bus, the at least two functional modules having a connection to the network bus.

12. The radio of claim 1, wherein the at least two functional modules are connected in series to form the internal network.

13. The radio of claim 1, wherein the internal network further comprises a central hub located within at least one of the at least two functional modules, other modules connected to the central hub.

14. The radio of claim 1, wherein at least one of the at least two functional modules further comprises:

- (a) a network controller; and
- (b) at least one network connector.

15. The radio of claim 1, wherein at least one of the at least two functional modules further comprises:

- (a) at least one memory unit storing the programmed instructions for the at least one of the at least two functional modules; and
- (b) at least one processing unit executing the programmed instructions.

16. The radio of claim 1, wherein the internal network facilitates conveying real time streaming media between the at least two functional modules.

17. The radio of claim 1, wherein:

- (a) at least one module receives a stream of input data and segments the stream of input data into data packets for communication over the internal network; and
- (b) a second module receives the data packets into buffers therein and assembles the data packets from the buffers for transmission from the radio as a stream of output data corresponding to the continuous stream of input data.

18. The radio of claim 1, wherein the internal network facilitates the addition and removal of the at least two functional modules by connection to and disconnection from the internal network, respectively.

19. The radio of claim 1, wherein the internal network is implemented over at least one of a twisted pair, a cable, a fiber and a wireless link.

20. The radio of claim 1, wherein the network assigns addresses to the at least two functional modules.

21. The radio of claim 1, wherein the network maintains a listing of the functional aspects of the radio and at least one functional module associated with the functional aspects.

22. The radio of claim 1, wherein the network facilitates loading the programmed instructions into the at least two functional modules.

23. The radio of claim 1, wherein the network controls the execution of the programmed instructions within the at least two functional modules.

24. The radio of claim 1, wherein the network monitors the status of the at least two functional modules.

25. The radio of claim 1, wherein the network facilitates replacement of a failed one of the at least two functional modules with a replacement module, the network loading the programmed instructions of the failed module into the replacement module to provide the functional aspect of the failed one of the at least two functional modules.

26. A computer-readable medium containing instructions for controlling a computer system to implement a programmable radio, by:

controlling functional modules of the radio to execute instructions to provide functional aspects of the radio; and

controlling packet network protocols on an internal network connecting the functional modules to provide communications between the functional modules over the internal network.

27. The computer-readable medium of claim 26, wherein controlling the computer to implement a radio further comprises controlling the internal network to be implemented as a network chosen from a category of networks consisting of an Ethernet network, an asynchronous transfer mode network, a token ring network and a resilient packet ring network.

28. The computer-readable medium of claim 27, wherein controlling the computer to implement a radio further comprises controlling the computer to choose the packet network protocols from a category of network protocols consisting of an Internet Protocol suite and a set of network standards conforming to IEEE 802.

29. The computer-readable medium of claim 28, wherein controlling the computer to implement a radio further comprises controlling the computer to choose the packet network protocols from a category of protocols consisting of a User Datagram Protocol, a Transmission Control Protocol, a RealTime Protocol, a Dynamic Host Configuration Protocol, a Bootstrap Protocol, a File Transfer Protocol, a Trivial File Transfer Protocol, a Simple Network Management Protocol and a Domain Name System.

30. The computer-readable medium of claim 29, wherein controlling the computer to implement a radio further comprises controlling the computer to implement network functions chosen from a list of network functions consisting of:

(a) assigning addresses to the functional modules;

(b) maintaining a listing of the functional aspects of the radio and the functional modules associated with the functional aspects;

(c) loading the instructions into the functional modules;

(d) controlling the execution of the instructions within the modules;

(e) monitoring the status of the modules; and

(f) replacing a failed one of the functional modules with a replacement module and loading the instructions of the failed one of the functional modules into the replacement module.

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31. The computer readable medium of claim 30, wherein controlling the computer to implement network functions further comprises:

(a) controlling at least one module to receive real time streaming media and segment the real time streaming media into data packets for communication over the internal network; and

(b) controlling a second module to receive the data packets into buffers therein and assemble the data packets from the buffers for transmission from the radio as a stream of output data corresponding to the real time streaming media.

32. The computer readable medium of claim 29, wherein controlling the computer to implement a radio comprises:

(a) controlling at least one module to receive real time streaming media and segment the real time streaming media into data packets for communication over the internal network; and

(b) controlling a second module to receive the data packets into buffers therein and assemble the data packets from the buffers for transmission from the radio as a stream of output data corresponding to the real time streaming media.

33. The computer-readable medium of claim 27, wherein controlling the computer to implement a radio further comprises controlling the computer to choose the packet network protocols from a category of protocols consisting of a User Datagram Protocol, a Transmission Control Protocol, a RealTime Protocol, a Dynamic Host Configuration Protocol, a Bootstrap Protocol, a File Transfer Protocol, a Trivial File Transfer Protocol, a Simple Network Management Protocol and a Domain Name System.

34. The computer-readable medium of claim 26 wherein controlling the computer to implement a radio further comprises controlling the computer to choose the packet network protocols from a category of protocols consisting of a User Datagram Protocol, a Transmission Control Protocol, a RealTime Protocol, a Dynamic Host Configuration Protocol, a Bootstrap Protocol, a File Transfer Protocol, a Trivial File Transfer Protocol, a Simple Network Management Protocol and a Domain Name System.

35. The computer-readable medium of claim 34, wherein controlling the computer to implement a radio further comprises controlling the computer to implement network functions chosen from a list of network functions consisting of:

- (a) assigning addresses to the functional modules;
- (b) maintaining a listing of the functional aspects of the radio and the functional modules associated with the functional aspects;

- (c) loading the instructions into the functional modules;
- (d) controlling the execution of the instructions within the modules;
- (e) monitoring the status of the modules; and
- (f) replacing a failed one of the functional modules with a replacement module and loading the instructions of the failed module into the replacement module.

36. The computer readable medium of claim 35, wherein controlling the computer to implement network functions further comprises:

- (a) controlling at least one module to receive real time streaming media and segment the real time streaming media into data packets for communication over the internal network; and
- (b) controlling a second module to receive the data packets into buffers therein and assemble the data packets from the buffers for transmission from the radio as a stream of output data corresponding to the real time streaming media.

37. The computer readable medium of claim 34, wherein controlling the computer to implement a radio comprises:

- (a) controlling at least one module to receive real time streaming media and segment the real time streaming media into data packets for communication over the internal network; and
- (b) controlling a second module to receive the data packets into buffers therein and assemble the data packets from the buffers for transmission from the radio as a stream of output data corresponding to the real time streaming media.

38. A method for providing communications between functional modules implementing a programmable radio, comprising:

- (a) providing an internal packet network between the functional modules; and
- (b) controlling packet network protocols on the internal packet network.

39. The method of claim 38, wherein providing the internal packet network comprises choosing the internal packet network from a category of internal packet networks consisting of an Ethernet network, an asynchronous transfer mode network, a token ring network and a resilient packet ring network.

40. The method of claim 39, wherein controlling the packet network protocols further comprises choosing the packet network protocols from a category of protocols consisting of a User Datagram Protocol, a Transmission Control Protocol, a RealTime Protocol, a Dynamic Host Configuration Protocol, a Bootstrap Protocol, a File Transfer Protocol, a Trivial File Transfer Protocol, a Simple Network Management Protocol and a Domain Name System.

41. The method of claim 40, wherein controlling the packet network protocols further comprises implementing network functions chosen from a list of network functions consisting of:

- (a) assigning addresses to the functional modules;
- (b) maintaining a listing of the functional aspects of the radio and the functional modules associated with the functional aspects;
- (c) loading the instructions into the functional modules;
- (d) controlling the execution of the instructions within the modules;

(e) monitoring the status of the modules; and

(f) replacing a failed one of the functional modules with a replacement module and loading the instructions of the failed one of the functional modules into the replacement module.

42. The method of claim 41, wherein implementing network functions further comprises:

(a) controlling at least one module to receive real time streaming media and segment the real time streaming media into data packets for communication over the internal network; and

(b) controlling a second module to receive the data packets into buffers therein and assemble the data packets from the buffers for transmission from the radio as a stream of output data corresponding to the real time streaming media.

43. The method of claim 40, wherein controlling the packet network protocols further comprises:

(a) controlling at least one module to receive real time streaming media and segment the real time streaming media into data packets for communication over the internal network; and

(b) controlling a second module to receive the data packets into buffers therein and assemble the data packets from the buffers for transmission from the radio as a stream of output data corresponding to the real time streaming media.

44. The method of claim 38, wherein controlling the packet network protocols further comprises choosing the packet network protocols from a category of protocols consisting of a User Datagram Protocol, a Transmission Control Protocol, a RealTime Protocol, a Dynamic

Host Configuration Protocol, a Bootstrap Protocol, a File Transfer Protocol, a Trivial File Transfer Protocol, a Simple Network Management Protocol and a Domain Name System.

45. The method of claim 44, wherein controlling the packet network protocols further comprises implementing network functions chosen from a list of network functions consisting of:

(a) assigning addresses to the functional modules;

(b) maintaining a listing of the functional aspects of the radio and the functional modules associated with the functional aspects;

(c) loading the instructions into the functional modules;

(d) controlling the execution of the instructions within the modules;

(e) monitoring the status of the modules; and

(f) replacing a failed one of the functional modules with a replacement module and loading the instructions of the failed module into the replacement module.

46. The method of claim 45, wherein implementing network functions further comprises:

(a) controlling at least one module to receive real time streaming media and segment the real time streaming media into data packets for communication over the internal network; and

(b) controlling a second module to receive the data packets into buffers therein and assemble the data packets from the buffers for transmission from the radio as a stream of output data corresponding to the real time streaming media.

47. The method of claim 38, wherein controlling packet network protocols further comprises:

(a) controlling at least one module to receive real time streaming media and segment the real time streaming media into data packets for communication over the internal network; and

(b) controlling a second module to receive the data packets into buffers therein and assemble the data packets from the buffers for transmission from the radio as a stream of output data corresponding to the real time streaming media.

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